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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/714,174

11/14/2003

Atsuhiko Sakurai

TI-35272

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06/12/2009

TEXAS INSTRUMENTS INCORPORATED

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EXAMINER

SAINT CYR, LEONARD

ART UNIT

PAPER NUMBER

2626

NOTIFICATION DATE

DELIVERY MODE

06/12/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspto@ti.com

Office Action Summary	Application No. 10/714,174	Applicant(s) SAKURAI ET AL.	
	Examiner LEONARD SAINT CYR	Art Unit 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/14/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Re-open Prosecution after Appeal Brief

1. In view of the supplemental appeal brief filed on 03/05/09, PROSECUTION IS HEREBY REOPENED. A new ground of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below.

Response to Arguments

2. Applicant's arguments with respect to claims 1 - 10 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues that neither Dolson nor Laroche (300) teach or suggest calculating a phase difference for the dominant spectral line of each spectral band by a

phase vocoder algorithm; calculating a phase difference for each of a predetermined number of spectral lines near the dominant spectral line within each spectral band as the phase difference of the corresponding dominant spectral line; calculating a phase difference for other spectral lines of each spectral band by the phase vocoder algorithm (Appeal Brief, pages 10 – 14).

Applicant argues that neither Dolson nor Laroche (300) teach or suggest the predetermined number of spectral lines near the dominant spectral line is 4 for a 1024-point spectrum (Appeal Brief, pages 14 – 16).

Applicant argues that neither Dolson nor Laroche (300) teach or suggest merging nearby spectral lines that are within a predetermined frequency range of each other prior to calculating the phase difference (Appeal brief, pages 15 – 17).

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1 - 5 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. As per the most recent interpretation of the Interim Guidelines regarding 35 U.S.C. 101, claims **1 - 5** define non-statutory processes because they merely manipulate an abstract idea (mathematical algorithm) without a

claimed limitation to produce a useful, concrete, tangible result. If the acts of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter (Benson, 409 U.S. at 71-72, 175, USPQ at 676). Furthermore, claims define nonstatutory processes if they simply manipulate abstract ideas (Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759). As for guidance to areas of statutory subject matter, see 35 U.S.C. 101 Interim Guidelines (with emphasis of the Clarification of Interim Guidelines For Examination of Patent Applications for Subject Matter Eligibility); as an example, in Alappat, the claimed output smooth waveform (consisted of lighting pixels on an oscilloscope/display) is a useful, concrete, tangible, final result; in Arrhythmia, the claimed useful, concrete, tangible, final result represented the condition of a patient's heart; in State Street, the claimed useful, concrete, tangible, final result was data output that represented a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent.

Claims **1 - 5** reviewed in light of the specification, simply recite an abstract idea for converting digital audio signal.

As can be seen by claims **1 - 5** these claims recite an abstract idea by setting forth the step of "calculating a phase difference for the dominant spectral line of each spectral band by a phase vocoder algorithm; calculating a phase difference for each of a predetermined number of spectral lines near the dominant spectral line within each spectral band as the phase difference of the corresponding dominant spectral line;

calculating a phase difference for other spectral lines of each spectral band by the phase vocoder algorithm” These steps are abstract in nature.

It is readily apparent that when claims **1 - 5** are each taken as a whole, the claims are directed to the preemption of an abstract idea, and thus are non-statutory.

Claims 1 - 5 are rejected under 35 USC 101 as not falling within one of the four statutory categories of invention. While the claims recite a series of steps to be performed, a statutory process under 35 USC 101 must be tied to another statutory category (such as a manufacture or a machine) or transform underlying subject matter (such as an article or material) to a different state or thing. The steps in those claims can be performed manually without the use of a particular machine. Those claims could be done in a piece of paper, by using digital signal processing (DSP) theory to derive all the values recited in the claims. Thus, claims **1 - 5** do not define a statutory process.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 1 – 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laroche (Improved Phase Vocoder Time-Scale modification of Audio, IEEE, 1999) in view of Laroche (US Patent 6, 766,300).

Regarding claims 1, and 6, Laroche (1999) discloses a method/apparatus of converting an input digital audio signal into an output digital audio signal having a modified time scale comprising the steps of:

calculating a discrete Fourier transform of first equally spaced, overlapping time windows having a first overlap amount of the input digital audio signal ("N is the size of the discrete Fourier transform...correspond to overlapping"; page 324, col.1, section A – col.2, paragraph 1);

partitioning the spectrum into a plurality of contiguous spectral bands ("the windowed short-time signals"; page 324, col.1, section A – col.2, paragraph 1);

identifying a dominant spectral line having the greatest magnitude within each spectral band ("searched local maxima...dominant peak"; page 329, col.1, paragraphs 2, and 3);

calculating a phase difference for the dominant spectral line of each spectral band by a phase vocoder algorithm ("**phase difference**"; page 329, col.1, paragraph 3; page 330, col.1, last 15 lines);

calculating a phase difference for each of a predetermined number of spectral lines near the dominant spectral line within each spectral band as the phase difference of the corresponding dominant spectral line; calculating a phase difference for other spectral lines of each spectral band by the phase vocoder algorithm ("**calculate analysis phase difference between peak and current channel, and calculate current synthesis phase using (16)**"; see also the steps of the scaled-phase-locking scheme summary; page 329, col.1, paragraph 3; page 330, col.1, last 15 lines); and

calculating an inverse discrete Fourier transform resulting in equally spaced, overlapping time windows having a second overlap amount employing the calculated phase difference for each spectral line, the second overlap selected having a ratio to the first overlap amount to achieve a desired time scale modification (**“resynthesis stage...obtained by inverse-Fourier-transform...satisfy strong consistency conditions...correspond to overlapping short-time signals”**; page 324, col.1, section A, paragraph 2 –col.2, paragraph 1).

However, Laroche (1999) does not specifically teach partitioning the spectrum into a plurality of contiguous spectral bands according to a Bark scale where each spectral band has an extent dependent upon human frequency perception.

Laroche (300) teaches that the duration of the window size and the size of the Fourier transform are usually set to 3 to 5 ms, which gives uniform frequency bands of about 300 Hz; a better sub-band decomposition could be used using frequency bands uniform in a bark scale (col.3, lines 51 - 58).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to used bark scale frequency division as taught by Laroche (300) in Laroche (1999), because that would help better divide the spectrum in better uniform frequency bands (col.3, lines 53 – 55).

As per claims 2, and 7, Laroche (1999) further suggests that the predetermined number of spectral lines near the dominant spectral line is 4 for a 1024-point spectrum (**“the fast Fourier transform size was set to 1024...for all channel k in the peak’s**

region of influence"; page 329, col.1, paragraphs 2, and 3; page 327, col.1, paragraph 2).

Regarding claims 3, and 8, Laroche (1999) further suggests merging nearby spectral lines that are within a predetermined frequency range of each other prior to calculating the phase difference ("**short-time signals will overlap coherently...overlap-adding small segment of waveform**"; page 330, col.2, last five lines; page 325, col.1, paragraph 2).

Regarding claims 4, and 9, Laroche (300) further discloses said that step of partitioning the spectrum into a plurality of contiguous spectral bands according to a Bark scale employs predetermined spectral bands unrelated to the digital audio signal ("a better sub-band decomposition could be used here...frequency bands uniform in a Bark-scale"; col.3, lines 55 - 61).

Allowable Subject Matter

5. Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter:

As to Claim 10, neither Laroche (300) nor Laroche (1999) teach or suggest partitioning the spectrum into a plurality of contiguous spectral bands includes adjusting

boundaries of spectral bands to maintain important frequency groups within the same spectral band.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEONARD SAINT CYR whose telephone number is (571) 272-4247. The examiner can normally be reached on Mon- Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LS
06/03/09

/Richemond Dorvil/

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Supervisory Patent Examiner, Art Unit 2626